requests reconsideration of this rejection in view of the following.

The claims of this application are directed to a method and apparatus for suppressing fires in a space. Non-azide solid propellant gas generators are used to suppress a fire, instead of compressed gas cylinders in a piping discharge system. Independent fire suppression apparatus may combine to form a fire suppression system in which each apparatus is positioned in an enclosure or space. The suppressing gas mixture claimed in the present application permits the space to be habitable by human life for a predetermined time. Furthermore, the provision of a gas mixture to the fire permits the method and system to be used as a "clean-agent" system. Fire suppression systems that are not categorized as "clean-agent" systems leave a residue that is, subsequent to fire extinguishment, required to be cleaned from objects in a space after fire suppression. Also, according to some embodiments, filtering of a second gas, such as carbon dioxide, improves support of human life and filtering of a second gas, such as water vapor, reduces formation of any substantial amounts of liquid water to prevent water damage.

With reference to page 4, paragraph [0017] of the present application, the claimed suppressing gas mixture permits the space to be habitable by human life for a predetermined time. Preferably, the predetermined time ranges from about one to five minutes, as per the requirements of the National Fire Prevention Association's 2001 standard for clean agent Halon 1301 alternatives. Because the gas mixture released contains no solid particulates, the system and method of the present invention provides a "clean" product resulting in elimination of potentially toxic particulates.

Holland et al. is directed to suppressing fires by releasing a combination of chemically active fire suppression agents and physically acting fire suppressant agents into a space. According to Holland's description, the combination of physically acting fire suppressant agents and chemically acting, environmentally innocuous fire suppression agents, results in a highly effective, environmentally innocuous fire extinguishing composition. Holland's chemically acting fire extinguishing agent is a solid particulate composition which includes finely powdered iodide salts, such as

potassium iodide (KI).

Particularly because of the release of solid particulates required for fire suppression, Holland's system is not a clean-agent system. Rather, Holland's system is an example of an "aerosol" system. Furthermore, it is not covered under the National Fire Protection Association's 2001 standard referred to in the present application. In fact, the National Fire Protection Association has had to develop a new standard directed to "aerosol" systems and known as NFPA 2010, in order to cover systems such as Holland's.

Claim 2 of the present application recites:

> A method of suppressing fires in a space comprising the steps of:
>
> (a) generating a first fire suppressing gas mixture from at least one non-azide solid propellant chemical, the first fire suppressing gas mixture comprising at least a first gas, said first gas comprising nitrogen; and
>
> (b) delivering at least said first gas into the space; and
>
> (c) filtering at least a percentage of a second gas from the first fire suppressing gas mixture prior to delivery into the space.

While the Examiner has indicated that Holland discloses an apparatus that includes a filter 40 to filter a portion of one of the gases, it is to be noted that bed 40 does not perform a filtering function, but rather includes a chemical fire suppression component, as well as optional ingredients such as one or more coolants. It is Holland's intention to emit a combination of physical and chemical fire suppressant agents through opening 46, but not to filter any of it. In fact, to provide a filter such as the one described and claimed in the present application would prevent the output of Holland's finely powdered potassium iodide (KI) and would therefore render Holland's apparatus insufficient for suppressing fires. The Examiner refers to Holland's description at column 7, from line 12 on, in which it is said that significant reductions in the amount of nitrogen needed for extinction can be achieved if KI is added to the nitrogen feed stream. Likewise, by using inert gases like nitrogen rather than air entrainment for delivery, significant reductions can be achieved in the amount of KI

necessary for flame extinction. Thus, while Holland proposes a combination of physically and chemically fire suppressant agents in order to reduce the amount of either that is required in order to effectively suppress a fire, Holland does not conduct the step of "**filtering at least a percentage of a second gas from the first fire suppressing gas mixture prior to delivery into the space**". Holland therefore does not anticipate claim 2. As claims 3 to 5 are dependent, directly or indirectly, on claim 2, claims 3 to 5 are also not anticipated by Holland.

Claim 7, as currently amended, recites:

> A method of suppressing fires in a space comprising the steps of:
>
> (a) generating a first fire suppressing gas mixture from at least one non-azide solid propellant chemical, the first fire suppressing gas mixture comprising at least a first gas, said first gas comprising nitrogen;
>
> (b) delivering only the first fire suppressing gas mixture into the space; and
>
> (c) reducing the temperature of the first fire suppressing gas mixture prior to delivering into the space.

As has been stated above, Holland is directed to delivering both chemically and physically acting fire suppression material into a space. The chemically acting fire suppression material proposed by Holland et al. is preferably powdered potassium iodide (KI). Thus, Holland et al. does not provide the step of "**delivering only the first fire suppressing gas mixture into the space**". As has been stated above, the present application describes and claims a clean-agent system, while Holland requires a non clean-agent, chemically-acting material such as finely powdered potassium iodide in order to function correctly. Holland therefore does not anticipate claim 7.

Claim 11 recites:

> An apparatus for suppressing fires in a normally occupied enclosed space comprising:
>
> (a) a sensor for detecting a fire;

(b) at least one solid inert gas generator that, in response to receiving a signal from the sensor, ignites to generate only a fire suppressing gas mixture for delivery into the enclosed space; and

(c) an inert gas discharge diffuser to direct the fire suppressing gas mixture into said enclosed space

wherein the fire suppressing gas mixture includes nitrogen and;

wherein the fire suppressing gas mixture includes at least one of water vapor and carbon dioxide.

Holland does not disclose "at least one solid inert gas generator that, in response to receiving a signal from the sensor ignites to generate **only a fire suppressing gas mixture for delivery into the enclosed space**" Furthermore, opening 46 of Holland's device in his Figure 2 is not a diffuser. Rather, element 46 in Figure 2 is merely an opening. One of the advantages of the present invention is that the apparatus can be sized sufficiently to add a large number of units to suppress fires in a very large space. Multiple units spaced throughout the compartment may be warranted to provide better mixing and inert gas coverage in the space. Various diffusers are shown in Figures 2a to 2d which act to direct and spread out the fire suppressing gas mixture. Therefore, Holland does not disclose "**an inert gas discharge diffuser to direct the fire suppressing gas mixture into said enclosed space**", and accordingly does not anticipate claim 11.

Claim 12 recites:

An apparatus for suppressing fires in a normally occupied enclosed space comprising:

(a) a sensor for detecting a fire;

(b) at least one solid inert gas generator that, in response to receiving a signal from the sensor, ignites to generate only a fire suppressing gas mixture for delivery into the enclosed space; and

(c) an inert gas discharge diffuser to direct the fire suppressing gas mixture into said enclosed space;

wherein the fire suppressing gas mixture comprises at lease two gases and the apparatus further comprises at least one filter for filtering at least a portion of at least one of the gases from the fire suppression gas mixture, prior to the delivery thereof to the enclosed space.

As stated above, Holland does not disclose "**at least one solid inert gas generator that, in response to receiving a signal from the sensor, ignites to generate only a fire suppressing gas mixture for delivery into the enclosed space**". Furthermore, as stated above, Holland does not disclose "**an inert gas discharge diffuser to direct the fire suppressing gas mixture into said enclosed space**". Additionally, as stated above, Holland does not disclose "**at least one filter for filtering at least a portion of at least one of the gases from the fire suppression gas mixture, prior to the delivery thereof to the enclosed space**". Holland therefore does not anticipate claim 12. As claim 13 is dependent on claim 12, claim 13 is also not anticipated by Holland.

Claim 15 recites:

A gas generator and delivery a fire suppressing gas mixture to an enclosed space, comprising:

a housing;

at least one pre-packed solid propellant disposed within said housing;

a pyrotechnic device for initiating ignition of said solid propellant to thereby generate only said fire suppressing gas mixture; and

a discharge diffuser for directing the fire suppressing gas mixture within said enclosed space;

at least one filter for filtering at least a portion of one gas from said fire suppressing gas mixture.

As stated above, Holland does not disclose "**a discharge diffuser for directing the fire suppressing gas mixture within said enclosed space**" nor "**at least one filter for filtering at least a portion of one gas from said fire suppressing gas mixture**". Holland therefore does not anticipate Claim 15.

Claim 18 recites:

A gas generator for generating and delivering a fire suppressing gas mixture to an enclosed space, comprising:

a housing;

at least one pre-packed solid propellant disposed within said housing;

a pyrotechnic device for initiating ignition of said solid propellant to thereby generate only said fire suppressing gas mixture; and

a discharge diffuser for directing the fire suppressing gas mixture within said enclosed space

wherein said discharge diffuser includes a 360° directional cap.

As stated above, Holland does not disclose a "**pyrotechnic device for initiating ignition of said solid propellant to thereby generate only said fire suppressing gas mixture**". Furthermore, Holland does not disclose "**a discharge diffuser for directing the fire suppressing gas mixture within said enclosed space**". Therefore, Holland does not anticipate claim 18.

In view of the above, withdrawal of the Examiner's rejection of claims 2, 4, 7, 11 to 13, 15 and 18 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,024,889 (Holland et al.) is respectfully requested.

Claims 16, 17, 19 and 20 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Holland et al. in view of U.S. Patent No. 5,876,062 (Hock). In view of the following, reconsideration of this rejection is respectfully requested.

Hock is directed to an automotive air-bag inflator and is unrelated to fire suppression. Hock's system is incapable of effectively providing a fire suppressing gas mixture into a room, but rather only into an airbag. Hock's device is complex and is triggered by a vehicle's on-board crash sensor circuit, not by a fire. Hock's "diffuser 14" is for directing flow into a small airbag enclosure, and its design is inappropriate for diffusion of a fire suppressing gas mixture into a space. Furthermore, the required volumes of gas for inflating an airbag would be much different than those required for suppressing a fire.

Despite Holland referring to automotive airbags in his background, it is with reference only to "Solid propellant ***formulations*** similar to those used in rocket engines and automotive airbags". Therefore Holland does not provide a clear directive to employ airbag inflating ***systems*** and related methods in order to provide functional fire suppression.

Furthermore, it is unlikely that one having ordinary skill in the art would be compelled to combine Holland and Hock, because Hock's outer toroidal chamber 30, referred to as a filter chamber, removes "entrained particulate residues prior to venting into the airbag cushion" (Abstract). Therefore, even if Hock's filter system were to be applied to the Holland et al. system, the potassium iodide particulates required by Holland to effectively suppress a fire would never be delivered into the space in order to be active as a chemical suppression agent. In this case, the fire would not be sufficiently suppressed.

Claim 16 recites:

> A gas generator for generating and delivering a fire suppressing gas mixture to an enclosed space, comprising:
>
> a housing;
>
> at least one pre-packed solid propellant disposed within said housing;
>
> a pyrotechnic device for initiating ignition of said solid propellant to thereby generate only said fire suppressing gas mixture; and
>
> a discharge diffuser for directing the fire suppressing gas mixture within said enclosed space
>
> at least one screen for reducing the temperature of said fire suppressing gas mixture.

As stated above, Holland does not disclose "**initiating ignition of said solid propellant the thereby generate only said fire suppressing gas mixture**". Furthermore, Holland does not disclose "**a discharge diffuser for directing the fire suppressing gas mixture within said enclosed space**". As stated above, Hock is

incompatible with Holland and therefore does not remedy these deficiencies. Therefore, Claim 16 is patentable over a combination of Holland and Hock.

Claim 17 recites:

A gas generator for generating and delivering a fire suppressing gas to an enclosed space, comprising:

a housing;

at least one pre-packed solid propellant disposed within said housing;

a pyrotechnic device for initiating ignition of said solid propellant to thereby generate only said fire suppressing gas mixture; and

a discharge diffuser for directing the fire suppressing gas mixture within said enclosed space;

wherein said discharge diffuser includes a 180° directional cap.

As stated above, Holland does not disclose "**initiating ignition of solid propellant to thereby generate only said fire suppressing gas mixture**" nor does Holland disclose "**a discharge diffuser for directing the fire suppressing gas mixture within said enclosed space**". As stated above, Hock is incompatible with Holland and therefore does not remedy these deficiencies. Therefore, Claim 17 is patentable over a combination of Holland and Hock.

Claim 19 recites:

A gas generator for generating and delivering a fire suppressing gas mixture to an enclosed space, comprising:

a housing;

at least one pre-packed solid propellant disposed within said housing;

a pyrotechnic device for initiating ignition of said solid propellant to thereby generate only said fire suppressing gas mixture; and

a discharge diffuser for directing the fire suppressing gas mixture within said enclosed space;

wherein said discharge diffuser includes a perforated cap.

Holland does not disclose "**initiating ignition of said solid propellant to thereby generate only said fire suppressing gas mixture**". Furthermore, Holland does not disclose "**a discharge diffuser for directing the fire suppressing gas mixture within said enclosed space**". As stated above, Hock is incompatible with Holland and therefore does not remedy these deficiencies. Therefore, Claim 19 is patentable over a combination of Holland and Hock.

Claim 20 recites:

A gas generator for generating and delivering a fire suppressing gas mixture to an enclosed space, comprising:

a housing;

at least one pre-packed solid propellant disposed within said housing;

a pyrotechnic device for initiating ignition of said solid propellant to thereby generate only said fire suppressing gas mixture; and

a discharge diffuser for directing the fire suppressing gas mixture within said enclosed space

wherein said discharge diffuser includes a 90° directional cap.

As stated above, Holland does not disclose "**initiating ignition of said solid propellant to thereby generate only said fire suppressing gas mixture**". Furthermore, Holland et al. does not disclose "**a discharge diffuser for directing the fire suppressing gas mixture within said enclosed space**". As stated above, Hock is incompatible with Holland and therefore does not remedy these deficiencies. Therefore, Claim 20 is patentable over a combination of Holland and Hock.

In view of the foregoing, withdrawal of the Examiner's rejection of claims 16, 17, 19 and 20 under 35 U.S.C. § 103(a) as being unpatentable over Holland et al. in view of U.S. Patent No. 5,876,062 (Hock) is respectfully requested.

In view of this response, it is respectfully submitted that the instant application is now in condition for allowance and that such allowance is earnestly requested.

Respectfully submitted,

Dated: December 9, 2005

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